

Response to Reviewer's Comments

Dear Reviewers,

Many thanks for your comments and suggestions. Please find below the response with alterations explained with reference to location in the manuscript.

Yours Sincerely

Hussam Elamin Ahmed (Corresponding Author)

MBBS MRES MRCS (Eng)

Direct Reply to Comments

- 1. The hypothesis of the study should be explicitly stated**
 - i. Hypothesis statement has been included in the introduction as per request
- 2. Please follow STROBE guideline by stating the type of study in the methods section. Is it a cohort, case-control or cross-sectional study?**
 - i. The study is a cohort study. This has now been included in the material and methods section
- 3. Outcomes are not defined with the methods section (or analysed appropriately in the results section)**
 - i. Proposed outcome section added within materials and methods
- 4. Exposures were not clearly defined in the methods section**
 - i. The exposure of all patients was sustaining a fracture neck of femur and thus being admitted under the care of trauma and orthopaedic surgery as a consequence. In addition all patients underwent bone mineral density scan post fracture. The points mentioned have been highlighted in the materials and methods section.
- 5. Methods used have confused the exposures and outcomes**
 - i. Exposures have been re-defined in the materials and methods section for clarity
- 6. Missing data was not described, explored or accounted for**
 - i. All patients included in the study had BMD data and FRAX score data available. This has been further highlighted in the results section
 - ii. Exclusion criteria were described in the materials and methods section
- 7. The statistical methods were poorly described throughout**
 - i. Statistical analysis section further developed in materials and methods section
- 8. P-values should be presented to 2 decimal places and effect estimates and 95% CI should be presented in all instances**
 - i. P-values altered to two decimal places as per request as per request
 - ii. *****
- 9. The authors should discuss what the clinical utility of these findings could be**
 - i. The potential impact on surgical technique and impact of nutritional status consideration in such patients has been added and highlighted in the discussion section
- 10. There should be more discussion of a possible mechanism**
 - i. Future research suggested – particularly in the context of a cross-sectional study of fragility fractures at differing ages group and further appropriate stratification as per age, with confounding factors adjusted for.
- 11. Explain what sort of future study might take us closer to a clinical utility**
 - i. Additional suggestion that this study supports the requirement for further research into the use of BMD as a surrogate biomarker for both fracture risk and osteoporosis prevention and management.

Further Alterations – as per scientific quality review

1. Core Tip section added as per request
2. Article highlights section added as per request
3. References altered as per request
4. Key words added as per request
5. Author contribution added as per request